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ABSTRACT

A report is presented of the findings of an investigation into the development of compliance, dependence and independence of two-year-old boys in the context of parent-child interaction, as well as in relation to genetic factors. The three techniques used in assessing children's and parents' characteristics and for studying the parent-child interaction were naturalistic home observation, ratings, and an experimental playroom situation. Data were analyzed by computer to yield counts of certain types of behavior. Results are inconclusive. (CK)

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PREDICTIONS FROM THREE DATA SOURCES - NATURALISTIC HOME OBSERVATION, RATINGS, EXPERIMENTAL SITUATION - IN THE AREA OF CHILD COMPLIANCE[1]

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The findings presented in this report are derived from the pilot year of a larger investigation into the development of compliance, dependence and independence of two year old boys in the context of parent-child interaction, as well as in relation to genetic factors. The assessment of a genetic contribution to these social characteristics is the reason for the inclusion of twins in the sample, but no results from this part of the investigation can as yet be reported. The twins in the sample also gave us the opportunity of studying the effects of twinship as such on the parent-child interaction, on the amount of play that parents indulge in with their children, on speech variables and so on. We did, indeed, find that twins make a difference in these variables, but above all: the amount of work for the mother and chaos in the house is about four times as much as for singletons!

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Methods

We used three different approaches in assessing children's and parents' characteristics and for studying the parent-child interaction: naturalistic home observation, ratings and an experimental playroom situation.

The home observation is done by a psychologist-research assistant and now also by two specially trained housewives. The actions of the child or the twins and the actions of all those around him which impinge on him are recorded in a detailed code, PACIC, which we derived from Caldwell's (1969) APPROACH code. (Example: C02M5C). The code, with 52 verbs, is pretty complex, but well suited to our needs. Training in its use takes at least fifty hours and for this we use videotaped observations, as well as real life situations. The essence of the coding procedure is that we record continuously, and do not simply record time-samples. This procedure was adopted because we wanted to note the sequence of behavior - what follows on a child's whining or a mother's command, for instance - and we would lose a great deal of these sequences if we sampled behavior only every six or ten seconds. At the time to which the present results relate the code was written down on the spot, but now the observer whispers it into a microphone. The other microphone of the stereophonic tape recorder picks up the family's verbal interaction and an electronic timer places a beep on the tape at ten second intervals. The observation is then corrected with the help of the family's recorded interaction and transcribed onto data sheets.

The data are analysed by computer to yield counts of certain types of behavior that we are specially interested in, e.g., incidents of compliance and noncompliance which are then expressed as a 'compliance ratio' (C / C + N), or behavior indicative of mother's affection, or of child's emotional dependence. Such summed behavior counts are then treated as indices of child or parent characteristics, such as child's compliance, mother's affection or use of induction, etc. We also have counts for child's and mother's and father's speech and for various kinds of activities that the child is engaged in. A program to analyse the sequences of behavior and compute transition probabilities of various types of behavior is going through the usual teething troubles just now.

Agreement on behavior codes between two observers has been calculated. The percentage of agreement for subject and verb combined over all statements ranged from 43% to 69%. Taking only those events noted by both observers into account, agreement on coding itself ranged from 76% to 86%. Inter-observer agreement on compliance and noncompliance by themselves reached as high as 72%. While these figures are far from ideal they are evidently what can be expected in a free-flowing situation. Caldwell (1969) obtained comparable levels of agreement using a similar code. It would no doubt be possible to achieve higher levels of agreement using a time-sampling procedure and evolving priority rules for coding one action only at specified points in time, but this would have lost us the advantage of the sequential and continuous record.

The second leg of the investigation consisted of ratings of child and mother. The child was rated on compliance and other characteristics of interest by one observer, the mother was rated on various characteristics which the literature suggests are related to child compliance. The mother ratings were given by a second observer in order to avoid contamination. Ratings were based on direct observation, as well as on an interview with the mother concerning her child rearing practices and attitudes. In addition, a 24-hour record which the mother completed hour by hour on everything that the child did and her feelings about his behavior was also taken into account in establishing the ratings. Inter-rater reliability for mother ratings overall was .82 and for child ratings .65.

The third leg of the investigation consisted of a structured situation in an experimental playroom designed to elicit manifestations of compliance or non-compliance. A score was assigned for the child's behavior in each situation and these scores were averaged to yield an overall score for compliance. Inter-observer reliability coefficients for these scores averaged .82 over five subjects.

The findings presented here are based on thirty boys, between two and three years old, both twins and singletons, about half from working and half from middle class homes.

Results and Discussion of Trait Analysis

Overt compliance was here being investigated as the presumed precursor of a child's internalized standards or 'conscience'. Whether

it is in fact related to later 'conscience' we cannot as yet say, as we had no measure of 'conscience' in the first year of the investigation. A rough assessment of this characteristic has since been introduced into the research.

I first intercorrelated all child and parent variables, derived from the three data sources, by means of Spearman's rhos. We had three measures for compliance: the behavior count, called Compliance Ratio, the Compliance Rating and the Compliance Playroom Measure. The behavior count correlated with the Compliance Rating only .33 (significant at the 10% level) and not significantly at all with the Playroom Compliance Measure. Between the Rating and the Playroom Measure there was a correlation of .53 (significant at the 1% level). It would appear that each index measures a somewhat different aspect of a loosely joined construct. But one can conclude that there seems to exist a certain commonality between the different indices, with the Rating providing the central meaning and forming the bridge between the other two measures.

Correlations between compliance and other <u>child</u> characteristics suggest that the child who shows compliance is also generally active and independent, but relatively low in the forms of dependency such as attention-seeking, support-seeking, being close to parents. (Negative correlation.)

Which <u>parent</u> characteristics best predict child compliance? In order to take account of the interrelations <u>among</u> parent variables and <u>among</u> criterion measures I first used canonical correlation to examine this question. The Spearman's correlations served as a basis for

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selecting the significant predictors (parent variables) to enter into the canonical equation. The first solution (Table 1) shows the maximum prediction that can be derived from the best weighted composite set of mother variables and the best weighted set of compliance measures.

The product-moment correlations in the table do not differ materially from the Spearman's rhos. The three predictor variables which here contribute most to the combined correlation, all in the positive direction, are Verbal-Psychological Punishment Rating, Consistency of Enforcement Rating and Amount of Play Rating. Physical Punishment also contributes, but in a negative direction. The fact that the Induction Rating with its strong and positive correlations with the criterion measures also makes a very slight and negative contribution to the canonical correlation is due to the fact that the Induction Rating shares a large portion of its variance with the chief contributors to the overall correlation and once these have been included in the equation the extra contribution it can make is not only slight but is best made by subtracting its variance out and thereby increasing the predictive power of the chief contributors. The Induction Rating acts as a "suppressor variable", in other words, once its influence is eliminated, consistency of enforcement, verbal-psychological punishment and amount of play assume even greater importance.

On the criterion side by far the greatest contribution to the canonical correlation comes from the Rating, followed by a small contribution from the Ratio (behavior count) and a negligible one from the Playroom Measure.

The second model (Table 2), has the variance pertaining to the first canonical correlation removed, and shows the Ratio taking pride of place. The Rating acts here as a suppressor variable and the Playroom Measure once again has negligible influence. Among the predictors the Induction Rating, in keeping with its general importance, makes the largest positive, and the Material Rewards Rating a large negative contribution to the overall correlation.

Table 3 shows prediction by stepwise multiple regression of Compliance Rating (top of table) and of Compliance Ratio (bottom of table). The multiple regression prediction of the Rating essentially reflects the first solution of the canonical equation, and the prediction of the Ratio reflects the second solution of the canonical equation. The two analyses - canonical and multiple regression - are consistent in showing Consistency of Enforcement, Amount of Play and Verbal-Psychological Punishment to be related to the Rating, and Induction to be positively related to the Ratio and Material Rewards negatively related to it.

These findings display considerable agreement with relationships for which some consensus exists in the literature, provided one makes some allowance for differences in variable names. The findings indicate that the development of overt compliance is fostered in a climate of close parent-child contact, where the mother adopts a psychological and cognitive orientation within the context of consistently enforced discipline. Emphasis on material and physical incentives, or an externalized orientation, however, inhibits such development. The cognitive theory as to the development of moral behavior thus receives support.

Relative utility of the three data sources

One can assess the comparative heuristic usefulness of the three data sources in terms of the useful network of relationships that each data source generated. I compared the number of significant correlations, predicted from theory, produced by each data source, relative to the number of measures available and found that the ratings showed the greatest pay-off, followed by the behavior counts, with the playroom measures coming a poor third. This is disappointing for those who believe in the advantages of direct observation and even more disappointing for those who pin their faith on the strict control and high reliability of the experiment. However, behavior counts differently conceived or summed, and experiments differently designed might produce a different set of results. In any case the present findings derive from the small numbers of the pilot study and are liable to revision when the results of the complete investigation become available.

References

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TABLE 1

Canonical Correlation

Compliance Prediction - First Solution

Var. No.	Predictors		Univariate Correlations 25	23	27	26	22	19	42	51	2	3	Standardized Coefficients
25	Verbal-Psychological Punishment Rating	M											.640
23	Consistency of Enforcement Rating	M	-.06										.549
27	Amount of Play Rating	M	-.21	.30									.515
26	Physical Punishment Rating	M	.60**	-.12	-.61**								-.344
22	Material Rewards Rating	M	-.15	.27	.08	-.25							-.050
19	Induction Rating	M	-.45*	.64**	.59**	-.63**	.30						-.040
42	Negative Initiated Contact	M	.22	-.22	-.34	.64**	-.08	-.45*					-.032
51	Social Class		-.06	.09	.34	-.14	.39	.12					-.184
	Criteria												
2	Compliance Rating	HO	.33	.57**	.56**	-.21	.12	.39*	-.25	.05			.927
3	Compliance Measure	PR	.10	.25	.25	-.26	.08	.19	-.20	.10	.48**		.013
17	Compliance Ratio-Count	HO	-.16	.27	.40*	-.32	-.40*	.51**	-.44*	-.12	.32	.03	.171

Canonical Correlation: .870 χ^2: 58.445 d.f.: 24 p: < .001 N: 30

Note.- M = Mother; HO = Home Observation; PR = Playroom.

*: $p < .05$
**: $p < .01$

TABLE 2

Canonical Correlation

Compliance Prediction - Second Solution

Var. No.	Predictors		Standardized Coefficients
19	Induction Rating	M	.931
22	Material Rewards Rating	M	-.804
23	Consistency of Enforcement Rating	M	-.365
42	Negative Initiated Contact	M	-.331
25	Verbal-Psychological Punishment Rating	M	-.273
26	Physical Punishment Rating	M	.249
27	Amount of Play Rating	M	-.244
51	Social Class		.096
	Criteria		
2	Compliance Rating	HO	-.584
3	Compliance Measure	PR	.185
17	Compliance Ratio-Count	HO	1.053

Canonical Correlation: .793 χ^2: 25.92 d.f.: 14 p: $< .05$

N: 30

Note:- M = Mother, HO = Home Observation, PR = Playroom.

Table 3

Multiple Regression Prediction of Compliance Rating (02)

Var #	Predictors		Multiple R	R^2	F for increment in R^2	Simple r	Beta
23	Consistency of Enforcement Rating	M	.566	.320	-	.566	.386
27	Play Rating	M	.695	.483	8.579**	.556	.440
25	Verbal-Psychological Punishment Rating	M	.831	.691	17.333**	.330	.482
33	Command/Prohibition Frequency Count	F	.838	.702		-.401	-.106
30	Monitoring Rating	M	.839	.704		.321	.046
35	Affection Frequency Count	F	.840	.705		.314	.061
41	Positive Initiated Contact Count	F	.840	.706		.320	-.040
19	Induction Rating	M	.841	.707[a]		.391	.054

Multiple Regression Prediction of Comply Ratio-Count (Var 017)

Var #	Predictors		Multiple R	R^2	F for increment in R^2	Simple r	Beta
19	Induction Rating	M	.511	.261	-	.511	.519
22	Material Rewards Rating	M	.774	.599	22.533**	-.398	-.544
38	Suggestion Frequency Count	M	.837	.701	8.5**	-.289	-.357
42	Negative Initiated Contact Count	M	.846	.716		-.435	-.127
27	Play Rating	M	.851	.725		.402	.140
23	Consistency of Enforcement Rating	M	.858	.735[b]		.274	.143

a) F for R^2: .707 = 4.218**

b) F for R^2: .735 = 7.410**

** $p < .01$

Physical Punishment Rating M (026) failed to meet program's criteria for inclusion.